AMENDMENTS TO THE SPECIFICATION:

Please amend the paragraph on page 1, lines 15 through 24 as follows:

Flat panel displays are currently widely used in various kinds of monitors for personal computers and the like, display elements for cellular phones and the like, and are expected to come into wider use than ever, including intended dissemination for use in large screen televisions in the future. Among them, the most prevalent are liquid crystal displays, and it is a color display mode called a micro-color filter mode that is widely used as a color display mode in the liquid crystal display.

Please amend the paragraph on page 1, line 25 through page 2, line 11 as follows:

The micro-color filter mode is such that one pixel is divided into at least three sub-pixels, and a color filter of three primary colors of red (R)/green (G)/blue (B) is formed for each pixel to provide full color display, and it has an advantage that a high level of color reproducibility can easily be achieved. On the other hand, the micro-color filter has a disadvantage that the transmittance decreases by a factor of 3, and light usage efficiency is thus reduced. The reduction in light usage efficiency causes an increase in power consumption of a back light of transmission liquid crystal display apparatus and a front light of reflection liquid crystal display apparatus.

Please amend the paragraph on page 3, lines 6 through 20 as follows:

~~Liquid~~ A liquid crystal display apparatus of ECB type (electrically controlled birefringence effect type) is known as a color liquid display apparatus using no color filter. The ECB-type liquid crystal display apparatus has a liquid crystal cell having a liquid crystal held between a pair of substrates, and in the case of the transmission type, polarizing plates are placed on the front surface side and the back surface side of the liquid crystal cell, respectively, and in the case of the reflection type, a single polarizing plate type in which a polarizing plate is placed on only one substrate, or a double polarizing plate type in which polarizing plates are placed on both substrates and reflecting plates are provided outside the polarizing plates is available.

Please amend the paragraph on page 3, line 21 through page 4, line 5 as follows:

In the case of a transmission ECB-type liquid crystal display apparatus, linearly polarized light incident through one polarizing plate is changed into light, with each wavelength light being elliptical polarized light having a different polarization state by a birefringent action of a liquid crystal layer in the process of passage through a liquid crystal cell, the light enters the other polarizing plate, and light passing through the other polarizing plate becomes colored light having a color according to the ratio of light intensity of each wavelength light comprising the light.

Please amend the paragraph on page 6, lines 9 through 17 as follows:

Hereinafter, a range of retardation of 0 to 250 nm wherein a brightness is modulated according to black to white through gray on the chromaticity diagram is referred to as a brightness modulation range, and a range of chromatic modulation of yellow or more (250 nm or more) is referred to as a color modulation range. Since the boundary between achromatic color and chromatic color cannot be determined, the value 250 nm regarding the above range is a tentative standard.

Please amend the paragraph on page 6, line 18 through page 7, line 3 as follows:

The present invention refers to colors obtained by retardation, which are colors along the curve in FIG. 1. As shown in FIG. 1, points at which the purity is maximum exist in the vicinities of area in which the retardations are 450 nm, 600 nm and 1300 nm, being recognized with eye as red, blue and green colors. However, there are ranges with about 100 nm width before and after these points wherein colors can be recognized as almost the same colors. Colors in the ranges are also called ~~as~~ red, blue and green respectively in the present invention. Magenta color exists in the vicinity of 530 nm intervening between red and blue colors.

Please amend the paragraph on page 8, lines 9 through 20 as follows:

In addition, a transflective liquid crystal display element with some areas of a liquid crystal display element being light reflecting areas and the other areas being optically transparent areas is disclosed in Sharp Technical Report No. 83, August, 2002, ~~p.22,~~ p. 22, and according to

this report, a thick inter-layer insulation film is provided in the reflection area so that the cell thickness of the transmission area is twice as large as that of the reflection area in order to light usage efficiencies of both the transmission area and reflection area are maximized.

Please amend the two paragraphs on page 12, lines 9 through 24 as follows:

According to still another aspect of the present invention, there is provided a method for providing color display using a color display element, characterized in that a color display element is formed using a medium having a color modulation range where a color is modulated by external modulation means, and a brightness modulation range where a brightness of a color is modulated by the modulation means, a unit pixel of the color display element is divided into a first sub-pixel and a second sub-pixel having a color filter, and the first sub-pixel is made to display chromatic colors within the color modulation ~~range ,~~ range, and the second sub-pixel is made to display a brightness of a color of the color filter within the brightness modulation range, whereby color display is provided.

Please amend the paragraph on page 17, lines 3 through 8 as follows:

Alternatively, the G pixel may be made to have a (maximum) transparent state, and the transparent pixel may be made to have a magenta color in a color area. The magenta color includes both ~~red®~~ red (R) and blue (B) colors, and thus white display is obtained as a result of synthesis.

Please amend the paragraph on page 19, lines 9 through 22 as follows:

According to the present invention, the necessity to extremely increase the cell thickness is eliminated compared to liquid crystal display elements that are usually used. According to FIG. 1, the red has a retardation value of 450 nm, and the blue has a retardation value of 600 nm. Thus, the cell thickness should be set to a level for achieving a retardation value of 600 nm. In the above example, the cell thickness should be only about 10 micrometers. As long as the cell thickness is kept at such a level, the response speed does not significantly increase, but remains at about 150 milliseconds, and dynamic picture images can be displayed although somewhat blurring occurs.

Please amend the paragraph on page 20, lines 7 through 13 as follows:

As described previously, gray level display in color display is difficult in the ECB mode, but in the present invention, continuous gray level display of green color can be provided, and therefore it is not recognized for human eyes that gray level characteristics are significantly impaired, and thus relatively good color images can be obtained.

Please amend the paragraph on page 22, lines 7 through 13 as follows:

In the liquid crystal display element of FIG. 2A, continuous gray level display can be provided for the green pixel having high visibility characteristics, but gray level display cannot

be provided for chromatic states of transparent pixel areas, i.e., blue and red, because coloring with ECB is utilized.

Please amend the paragraph on page 23, lines 1 through 14 as follows:

In the liquid crystal display element of the present invention, the digital gray level is used only for red and blue having low visibility characteristics. Adding continuous modulations in a range of 0 to 250 nm to the green pixel makes it possible to display a continuous tone. As a result, ~~eye of man~~ a person's eye has no sense of feeling that the tone has been substantively marred, so that the relatively good color image can be obtained. That is, the present invention is also characterized in that the digital gray level is used only for red and blue having a limited number of gray levels that can be sensed by human eyes, whereby sufficient characteristics can be provided even with a limited number of gray levels.

Please amend the paragraph on page 26, lines 5 through 17 as follows:

For meeting such needs, methods in which the number of colors can be increased with this mode as a base include:

(1) a method of utilizing the coloring phenomenon with the ECB effect in retardation values, other than those of red and blue colors;

(2) a method of utilizing continuous gray level colors in a low retardation range of a pixel provided with a color filter complementary in color to green; and

(3) a method of adding a pixel provided with any one of color filters of red and blue colors. Each of the above methods will be described below.

Please amend the paragraph on page 26, line 22 through page 27, line 15 as follows:

A principle of providing red and blue display utilizing a coloring phenomenon with the ECB effect has been described above. In this coloring phenomenon with the ECB effect, the color tone can be continuously changed from the white color to the blue color as shown in FIG. 9. That is, a large number of display colors capable of being used exist in addition to the red and blue color display described above, and by using such display colors, a larger number of display colors than those described above can be represented. Specifically, to describe a display color change under the crossed Nicol in a configuration where the sub-pixel 1 is provided with no color filter, an achromatic brightness change from black display to gray (intermediate tone) to white display occurs as the retardation amount increases from zero as shown by the arrow mark in FIG. 9, and various chromatic colors can be changed from yellow to yellowish red to red to reddish purple to purple to bluish purple to blue in the range of retardation amounts exceeding a white range.

Please amend the paragraph on page 29, line 20 through page 30, line 6 as follows:

In comparison with FIG. 9, the range of chromaticity change expands to near saturated colors of red and blue (corners of chromaticity diagram), and it can be thus understood that the

color reproduction range of red and blue is widened by providing a magenta color filter. In addition, a change from red to blue proceeds along the lower side of the chromaticity diagram, it can also be understood that a continuous change in mixed color from red to ~~bleu~~ blue is obtained. In this way, by providing a magenta color filter, the color reproduction range of red and blue is widened and at the same time, a continuous change in intermediate color is obtained when the retardation change occurs.

Please amend the paragraph on page 30, lines 21 through 24 as follows:

If a black color is ~~display~~ displayed, respective single colors of G/R/B are displayed, or mixed colors thereof are displayed, and operations are performed in the same manner as in the basic form.

Please amend the paragraph on page 31, lines 1 through 8 as follows:

By using a color filter complementary in color to the green color such as the magenta color as in this alteration example, achromatic gray level representation can be provided, and at the same time, gray level representation of a color complementary in color to the green can be provided, thus making it possible to significantly increase the number of display colors capable of being represented.

Please amend the paragraph on page 31, lines 9 through 12 as follows:

Magenta color filters ~~transmits~~ transmit both red and blue so that a bright display in comparison with that in a conventional method wherein red and blue color filters are set can be obtained.

Please amend the paragraph on page 33, lines 13 through 26 as follows:

On the other hand, in the configuration described in the alteration example 2, i.e., in the case where a magenta color filter complementary in color to green is provided, the brightness of magenta color can be changed by changing the retardation of the magenta pixel within the range of 0 to 250 nm. Display colors within this range exist on the axis along the direction of a combined vector of R and B shown by the arrow mark in FIG. 12 on the RB plane, which accounts for exhibition of a continuous change in brightness. That is, in the alteration example 2, the Bk point (original point), the R point, the B point and any point on the arrow mark can be used as display colors.

Please amend the paragraph on page 35, lines 9 through 12 as follows:

Based on the same discussion, display colors that can be taken when the pixel using the coloring phenomenon based on the ECB effect is divided in the ratio of ~~1;2;4~~ 1:2:4 are shown by arrow marks in FIG. 14.

Please amend the paragraph on page 35, lines 13 through 22 as follows:

In general, it makes it possible to display a digital magenta halftone that a magenta color filter is located on the first sub-pixel, which is a sub-pixel utilizing a coloring phenomenon based on ECB effect, the sub-pixel is divided into a plurality of sub-pixels having different areas to make a part of the sub-pixels display red or blue according to ECB effect and to make the others carry out the displaying which changes the brightness, whereby a digital magenta halftone can be displayed.

Please amend the paragraph on page 37, lines 6 through 26 as follows:

The sizes of pixels 55 and 56 having red and blue color filters, which are added at this time, may be no greater than an area equivalent to that of the sub-pixel 54 of which the area is the smallest of the sub-pixels 52, 53 and 54 obtained by dividing the pixel as described above. That is, in FIG. 14, for example, displayable points I, the range of from the Bk point to ~~R7and~~ R7 and B7 points each shown by a circle mark, are arranged at equal intervals. Any point on the arrow mark extending along the direction of the RB combined vector from the circle mark can be taken. To the configuration capable of displaying such colors are added pixels 55 and 56 having red and blue color filters, which have areas equivalent to that of the sub-pixel of which the area is the smallest of those of divided sub-pixels, whereby any point on the arrow marks shown as R-CF and B-CF in FIG. 15 can be subjected to additive color mixture. Consequently, all points on the RB plane can be represented, thus making it possible to provide perfect analog full color display.

Please amend the paragraph on page 38, lines 13 through 27 as follows:

Furthermore, at this time, an effective effect can be achieved even if both of red and blue color filters are not added. FIG. 2F shows an example thereof, in which there exists only the pixel 56 having a red color filter. A range of displayable colors when only a red color filter is added is shown as a hatched area in FIG. 16. In this figure, all colors can be represented in the red direction, but display colors incapable of being represented exist in the blue direction. For visibility characteristics of human beings, however, the blue color is most insensitive, and it is thus considered that the blue color may have a least number of gray levels. Therefore, by adding only a red color, display colors equivalent to full colors can be obtained.

Please amend the paragraph on page 40, line 27 through page 41, line 5 as follows:

On the other hand, the MVA (Multidomain ~~Virtical~~ Vertical Alignment) mode has been already commercialized as a mode having excellent viewing angle characteristics, and widely used. In addition, a mode called PVA (Patterned ~~Virtical~~ Vertical Alignment) mode is widely used.

Please amend the paragraph on page 42, lines 2 through 21 as follows:

First, for the sake of simplification, the liquid crystal layer 5 is not orientationally divided. Furthermore, for the sake of simplification, only a wavelength of 550 nm (single wavelength) is used. The phase compensation plate 2 is uniaxial, the retardation amount thereof is 137.5 nm, and a delay phase axis is situated at an angle of 45 deg. clockwise (viewed from a

polarizing axis 8 of the polarizing plate 1). In addition, the liquid crystal layer 5 is vertically oriented when no voltage is applied, and will be described using ~~so called a~~ a so-called VA mode in which molecules are leaned by application of a voltage. At this time, liquid crystal molecules are leaned in a direction of ~~45 deg.~~ 45 degrees clockwise (viewed from a polarizing axis 8 on the polarizing plate side) relative to the polarizing plate 1. A situation at this time is shown in FIG. 4A. Furthermore, in this figure, reference numeral 9 denotes an optical axis of the phase compensation plate 2.

Please amend the paragraph on page 43, lines 15 through 17 as follows:

In this way, the reflectance when no voltage is applied is 0, i.e., it is a normally black configuration.

Please amend the paragraph on page 52, line 23 through page 53, line 9 as follows:

Transparent electrodes 61, 62 and 63 are preferably identical in area, and the ratio of the area of the reflection electrode 64 to the area of the reflection electrode 66 is preferably 1:2. Furthermore, it is more preferable that the ratios in area are finely adjusted in consideration of balance of the color filter transmittance. The ratio of the area of a ~~sub-pigment 1~~ sub-pixel 1 comprised of reflection electrodes 64 and 66 to the area of a sub-pixel 2 comprised of the reflection electrode 65 is preferably finely adjusted as appropriate according to wavelength

spectral transmission characteristics of the color filter for use in the sub-pixel 2 to ensure optimum color balance.

Please amend the paragraph on page 57, lines 10 through 13 as follows:

In addition, in both Figures 18 and 19, a total of nine sub-pixels are preferably configured to be capable of being given image information signals independently.

Please amend the paragraph on page 57, line 26 through page 58, line 9 as follows:

In this way, ~~Concerns~~ concerns may arise that if the environmental illumination intensity is high, display quality is slightly ~~degrade~~ degraded because image information of reflection-type pixels is predominant. However, because red and blue pixels for use in reflection-type display essentially have areas occupying a small proportion in one pixel, and most of image information is determined by a green color filter pixel and pixels using a change in color tone with the ECB effect, it can be considered that degradation of display quality is not significant.

Please amend the paragraph on page 58, line 27 through page 59, line 7 as follows:

For example, in the case where a display element having a configuration of FIG. 19 is driven using TFT, a total of nine TFT elements are required for one pixel if all pixels are to be

independently driven, while only seven TFT elements should be provided by achieving a configuration such that common information signals are applied as described above.

Please amend the paragraph on page 61, line 21 through page 62, line 3 as follows:

The essence of the present invention is to obtain multi-color display with a high light usage efficiency on the basis of a basic principle that continuous gray levels using a color filter are obtained in green display best for visibility characteristics of human beings, thus making it possible to apply [[a]] various modes such as a liquid crystal mode having a twisted orientation state such as an STN mode, a selective reflectance mode, and a guest host mode.

Please amend the paragraph on page 62, lines 6 through 15 as follows:

The present invention has been described in detail above, centering on the ECB effect of a liquid crystal. However, the basic idea of the present invention is to provide color in which a color filter is applied to a monochromatic display mode for some pixels, and to use a display mode in which color change can occur for other pixels. Thus, other than the configuration using the ECB effect, any display modes can be applied for any element to which the above described display mode can be applied.

Please amend the paragraph on page 62, lines 16 through 20 as follows:

As an example thereof, (1) a mode in which the gap distance of an interference layer is changed by mechanical modulation and (2) a mode in which switching is made between display and non-display by moving coloring particles will be described.

Please amend the paragraph on page 70, lines 8 through 14 as follows:

Each pixel was divided into three sub-pixels, a color filter was used only for green, and the remaining other two sub-pixels were kept transparent with no color filters provided therein so that colored display with retardation was used. In addition, the ratio of the areas of these remaining two pixels was 2:1 for area gradation.

Please amend the paragraph on page 72, lines 12 through 14 as follows:

The reflectance of this element is 33%, and thus very bright white display ~~us~~ is provided compared to Comparative Example.